

# Vocabulary

Word	Meaning
Consistent	if it has at least one solution.
Row equivalent	if a sequence of row operations transforms one matrix into the other.
Unique solution	if and only if there are no free variables
Homogeneous	Linear systems of the form $A\mathbf{x} = \mathbf{0}$
Inhomogeneous	Linear systems of the form $A\mathbf{x} = \mathbf{b}$ where $\mathbf{b} \neq \mathbf{0}$
Trivial solution	the solution is the zero vector
Linearly independent	if no vector can be made from other vectors
Row operations	Addition, Interchange, Scaling
Pivot position	a leading 1 in the RREF of A
Pivot column	is a column of A that contains a pivot position
Domain	$T : \mathbb{R}^n \rightarrow \mathbb{R}^m$ ; $\mathbb{R}^n$ is the domain of $T$
Codomain	$T : \mathbb{R}^n \rightarrow \mathbb{R}^m$ ; $\mathbb{R}^m$ is the codomain of $T$
Image	The vector $T(\vec{x})$ is the image of $\vec{x}$ under $T$
Range	The set of all possible images $T(\vec{x})$ or simply the <b>span of A</b>
Standard vectors	The column of the identity matrix (think $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ and $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ )
Onto	All the elements in the codomain are mapped to. (A spans the entire codomain), Every <b>row</b> is pivotal
One-To-One	Each mapping is unique (2 vectors can <b>NOT</b> map to the same vector), Every <b>column</b> is pivotal